7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

by a snail living in irrigation canals, can be combatted by elimination of stagnant, polluted water in which the snail thrives and by treating canals twice yearly with copper sulphate. DDT spraying and the elimination of stagnant water assist in the reduction of malaria. In order to combat both malaria and bilharzia, major irrigation canals should be designed so as to maintain a rate of water flow no less than three miles per hour, and minor distributory canals so as to insure rapid drying-out after use. It is important that one complete "dry-out" per week be enforced in every section under irrigated cultivation.

Knowledge of such methods of combatting disease is already available in Iraq. What is needed is wider dissemination of the knowledge and a vigorous campaign to give it effect. The Endemic Diseases Institute in Iraq has done much useful work in this field but it has been handicapped by insufficient transport, supplies and technical personnel. In the future there will be no justification for denying the Institute adequate funds for its work. It would be well to organize special campaigns in those provinces or districts where the incidence of a particular endemic disease has been especially high. Such a campaign would involve a simultaneous effort to treat the people already afflicted in the locality and to teach local officials and the local inhabitants in general the appropriate preventive measures. Mobile dispensaries and mobile vans equipped to show educational films would be especially useful for this purpose.

Curative Services

On the curative side, principal emphasis must first be placed on the improvement of existing hospitals and an expansion in the nursing service. In its five-year program the Development Board has allotted ID 3,800,000 for medical service buildings. The Mission believes that a large part of this sum should be used to modernize, extend or replace existing hospitals and improve their facilities for diagnosis and treatment rather than to construct additional hospitals. In the monograph on public health the Mission has listed the most urgent projects of this kind which it suggests should be undertaken in adition to those for which provision was made in the first annual budget of the Development Board. While the number

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

Shitwi (winter) cultivation is, on account of the low temperature, far less likely to spread schistosomiasis than *saifi* (summer) cultivation. In considering any expansion of summer cultivation, therefore, the attendant health hazards should be carefully considered.

To carry out mass treatment of the people an expansion of the dispensary system is necessary together with the provision of mobile dispensaries. Initially four of these mobile dispensaries might be put into operation in the provinces having the highest incidence of schistosomiasis. The cost of each, including three motor vehicles, tents, 20 beds and supplies, would probably not exceed ID 5,000. In addition, an increase is required in the number of vehicles available to the Endemic Diseases Institute and provision must be made for an adequate and constant supply of copper salts.

Malaria

There can be no doubt that irrigation has been associated with a considerable increase in the malaria of the plains. Gravity or flow irrigation may lead to flooding of land or to seepage due to the faulty construction of canal banks. Water is precious where irrigation is carried out by lift and is not commonly wasted; consequently, flooding of land is rare. A third form of irrigation employed—namely that by natural inundation—is only seasonal.

Much work has been done in the Endemic Diseases Institute on studies of malaria in Iraq and also on the bionomics of the chief vectors of the disease. It has been discovered that in the North the mosquito *A. sacharovi* is associated with high endemicity. It breeds mostly in seepage water, open pools and in rice cultivation, and appears to be associated with sharp outbreaks of malaria when it descends occasionally into the plains.

In the South and spreading as far north as 34°N., *A. stephensi* breeds in similar conditions to those in which *A. sacharovi* develops in the North; it favors particularly water in small borrow pits, seepage water and the small irrigation channels of the date palm gardens. The *A. stephensi* mosquito is generally found in those areas where the level of the subsoil water is high. It is a highly efficient carrier of malaria and used to be found in the houses of Baghdad during the summer.

3:Royal Institute of International Affairs U-4 (no date)1954 MI Middle East
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164 helminthosis are endemic. There are occasional outbreaks of
657 smallpox, typhus, and more rarely plague and cholera. With the greater provision in the budget for schemes of public health, the increased employment of international specialists and the considerable assistance tendered by the World Health Organization, there is every prospect that the incidence of endemic
874 diseases will be greatly reduced. Fundamental results may be
742 expected from modern medical training, with emphasis on the environmental aspects of disease and the need for prevention
657 as much as or even more than cure, and, above all, from the
743 efforts of the administration to improve the environment itself,
[312] with especial reference to drainage and water-supply. In addition, attention is to be paid to the public health aspects of the pilgrimages. The curative services have in general received more attention than the preventive and have improved considerably in the past thirty years. Simple conditions are treated in some 400 state dispensaries, distributed fairly evenly throughout the country but varying in their equipment and staff; it has hitherto proved difficult to attract doctors to the provinces and particularly to the rural districts. Each *liwa* centre has a general hospital, the larger towns more than one. There are also specialized hospitals for maternity and child welfare, for infectious, chest, eye, venereal, and mental diseases, and for lepers. The army, police, railways, Port of Basra, Ministry of Education, and oil companies maintain their own medical services and hospitals, and there are in addition an American Mission Hospital and a number of private nursing homes. A five-year programme, financed by the Development Board, will provide for the repair, extension, and replacement of medical buildings which have become old or inadequate. There is an acute shortage of well-trained nurses; attempts to expand the service are hampered by the reluctance of Muslim girls of good family to enter it.

Education

658 The state provides elementary, intermediate, secondary, and
871 higher education, all, since December 1952, completely free. There are also private and foreign schools on a kindergarten, elementary, intermediate, and secondary level.

State Education. Primary education, by law universal and compulsory where facilities exist, begins at the age of six and continues for six years. It has been limited by a shortage of schools and trained teachers, especially in the villages. Plans are in hand to meet the need. The rapid expansion of state primary education is demonstrated in the following table:

44:Matthews and Akrawi S,G-3 (1945-1946)1949 MI Middle East
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professors of the medical college who are nominated by the board of studies and approved by the Minister of Social Affairs. Members of the faculty have received their medical training at universities and hospitals in England, Egypt, Turkey, Paris, and Beirut.

[346] The College is housed in a modern building specially built for it with fairly extensive laboratories, dissection rooms, and lecture halls, large enough to accommodate 60 to 70 students in each of the six years. In addition, the College enjoys the extensive facilities of the teaching hospital on [743] the grounds of which it is situated. This largest of Iraq's hospitals has 600 beds in large wards and semiprivate and private rooms, thus accommodating patients of all classes. As the hospital receives patients not only from the Baghdad area, but also from all parts of Iraq, students have a chance of seeing a very large and representative variety of cases and diseases. The hospital has a very large outpatient clinic occupying a two-story building and some annexes where more than 700,000 new cases are treated each [742] year. Next to the College building is the large building housing the pathological and bacteriological institutes and the antirabic and vaccine-production institutes. On the same grounds is also the extensive X-ray building with facilities for both X-ray diagnosis and therapy, including fluoroscopy and radium therapy. All these facilities form part of the teaching facilities of the College.

The College of Pharmacy

The College of Pharmacy, included for administrative purposes in the Royal College of Medicine, was established in 1936 and provides graduates of the secondary school with a four-year course leading to a Diploma of Pharmaceutical Chemist. In 1945–46 the enrollment was 98, with the four classes about equal in size. Upon graduation the student spends six months in practical work with a registered pharmacist and three months in a government dispensary. Students are admitted on the basis of a medical examination, public secondary-school examinations, personal interview, and geographical and minority distribution. Those who sign a contract to serve the Department of Health for four years after graduation are exempt from all fees except an instruction fee of 3 dinars ($12) yearly. Tuition fees for others are 33 dinars ($132) per year.

The College is administered by the dean assisted by a college board composed of permanent professors and lecturers. Members of the teaching staff are nominated by the dean, subject to the approval of the college board and confirmation by the Director General of Health.

The curriculum includes botany, general chemistry, business methods

000 istrative branches. The Director of Curative
744 Medicine has supervision over 4 depart-
657 ments: hospitals, dispensaries and pharma-
743 cies; rural health; technical institutes, including 6 laboratory sections; and medical stores. Under the Director of Preventive and Social Medicine are departments of endemic diseases, sanitation, social health, quarantine and epidemics, vital statistics and disease registration. Subordinate sections dealing with maternal and child health, venereal diseases, pulmonary diseases and health propaganda are incorporated in the Department of Social Health, while supervision over the health services of both the province and the city of Baghdad falls within the scope of the Department of
742 Sanitation. The Department of Endemic Diseases carries on research and field programs for the control of malaria, schistosomiasis and hookworm infection, some of which were initiated by the then Institute of Endemic Diseases, created in 1949. Further changes in organization, making the Director of Preventive and Social Medicine a Director General immediately responsible to the Minister, were proposed in 1953.

746 Subordinate provincial organizations carry out the functions of the Ministry of Health in the 14 *liwas*, or provinces. Chief medical officers are appointed to each *liwa* and are responsible for the conduct of the various medical services. They undertake some public health activities, but, to a large extent, the preventive services are directed from Baghdad. Municipal health divisions are established in Baghdad and the principal cities.

744 Other ministries are also concerned in some measure with the public health. The Ministry of Education operates school health services in Baghdad and the larger urban centers, and introduces instruction in the basic principles of health through the schools in urban and rural areas. The Ministry of Economics has veterinary and agriculture departments: the former has meat and dairy inspection services; the latter runs an experimental farm and a pas-

743 744 tion of rural health centers, each to serve an area of 20,000 to 30,000 population, as rapidly as adequate staff and funds become available.

742 Laboratories. The central laboratory facilities of the Ministry of Health are concentrated in 6 institutes, all with headquarters in Baghdad. The pathologic and bacteriologic institutes are associated with the Royal College of Medicine, and combine research and teaching with routine laboratory functions. The Institute of Bacteriology consists of a diagnostic section, equipped for the conduct of serologic, bacteriologic and parasitologic examinations, and a vaccine unit for the preparation of typhoid, plague and cholera vaccines. The Institute of Pathology has divisions for the performance of biochemical and pathologic examinations. A third institute merges the former Vaccine Lymph Institute, which manufactures smallpox vaccine for use throughout the country, and the Antirabic Institute, which prepares rabies vaccine and provides treatment and diagnostic services. The Medico-Legal Institute incorporates forensic medicine, anatomy and photographic sections. The Chemical Institute has facilities for the analysis of food, water and milk, and of various agricultural and industrial preparations. An Institute of Roentgenology, with branches in Baghdad, Basra, Mosul and Kirkuk, furnishes diagnostic and treatment services. The Department of Endemic Diseases operates a diagnostic and research laboratory in Baghdad, in connection with the government's malaria, schistosomiasis and hookworm control programs. Field units are stationed in the northern, the central and the southern provinces.

An Institute of Medical Research is established at the Royal College of Medicine: it includes clinical divisions and pathologic, chemical and biochemical laboratories. A research serologic laboratory is maintained in Baghdad in conjunction with the World Health Organization's syphilis-bejel control program. Clinical laboratory

63:Simmons et al G-5 (1941-1951) 1954
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facilities are available in the larger hospitals. The Veterinary Department in the Ministry of Economics also maintains a laboratory for research in the control of animal diseases. 742

Schools. The Royal College of Medicine in Baghdad was founded in 1927, and is the only medical school in Iraq. The Royal Hospital and the medical and associated schools are administered by the Dean of the Royal Faculty of Medicine. The course of instruction in the medical school covers 6 years, plus an additional year of internship. The teaching is in English, and a limited number of British and Dutch physicians are included on the professorial staff. The Iraqi degree meets the requirements of the General Medical Council of Great Britain. A complete medical education may be acquired at public expense, but graduates are obligated to serve for 4 or more years with the Ministry or some other government organization. 874 [754]

Schools for health officials and for nurses are affiliated with the medical school. The School of Health Officials offers a 5-year course for the training of medical assistants, many of whom are assigned to operate the rural dispensaries.

The School of Nursing and Midwifery is attached to the Royal Hospital and provides the standard 3-year course of instruction. Diplomas in midwifery are granted following a postgraduate year of work in that field. The development of facilities for the training of nurses is proposed by the Ministry of Health, and a nursing consultant has recently been appointed to the headquarters staff. A small training school for nurses is connected with the Seventh Day Adventist hospital in Baghdad. Courses covering 1 year of practical instruction are provided for nurses and midwives in hospitals in Kirkuk, Basra and Mosul. Male nurses and medical attendants are trained in the larger hospitals.

A College of Pharmacy and Chemistry is incorporated in the Faculty of Medicine. It

164 361 369 Basra to 75 per cent at Al Qurnah, in the fork between the rivers. In Muntafiq, the mean rate was 47 per cent, and in Diwaniya, 26 per cent, although some districts were heavily infected and others practically free. In central Iraq the disease was more irregular in distribution. In Baghdad *liwa* the infection rates averaged 35 per cent, but approached 80 per cent in some localities. In Kut, the mean was 48 per cent, with a decrease in prevalence toward the Iranian frontier. In Hilla, it was 15 per cent, with variations from 5 to 50 per cent, and in Kerbela, 28 per cent, with variations from 18 to 48 per cent. In the areas studied in Diyala *liwa* it ranged from 28 to 60 per cent, and in Dulaim it approximated 36 per cent. Subsequent surveys have revealed 11 to 18 per cent infection in limited foci near the marshes in Mosul *liwa*.

164 361 369 742 In a survey conducted in Baghdad in 1950-51,[57] ova of *S. haematobium* were found in 25 per cent of the urine samples collected from 285 schoolchildren and in 46 per cent of the samples from 242 inhabitants in hut settlements on the outskirts of the city. The prevalence was around 20 to 25 per cent in the suburbs, but reached 83 per cent in foci along the main road to Teheran.

164 462 Indigenous cases of *S. mansoni* infection have not been reported, but numerous cases of rectal involvement with *S. haematobium* have been observed. A dermatitis produced by nonhuman schistosome cercariae is common in the south and is often responsible for considerable disability among the agricultural workers.

164 462 312 744 Schistosomiasis constitutes one of the most important disease problems in Iraq. It is of major public health and economic significance, and the possibility of its spread with the expansion of irrigation is a matter of considerable concern to the government authorities. An active schistosomiasis control program is carried on by the Bilharzia Section of the Department of Endemic Diseases. This section maintains snail destruction and treatment units in the affected

164 provinces, and conducts research and field
462 investigations on the distribution and the
312 control of the disease and the intermediate
744 snail host. In the 7 years 1944-50, from 15,800 to 27,300 persons were treated annually in government hospitals and dis-
164 pensaries. The disease is considered com-
758 monplace in most areas, however, and probably not over 5 to 6 per cent of the infected individuals seek treatment under
743 ordinary conditions. Since 1949, special dis-
164 pensaries have been established in Baghdad, Basra and Kufa, while mobile clinics tour the most seriously infected districts. In 1950, there were 11 mobile units for the treatment of schistosomiasis, malaria and hookworm infection among the rural populations.

164 ANCYLOSTOMIASIS. Ancylostomiasis is
361 widespread in the irrigated areas, but the exact distribution and severity of the infection in the different provinces are not accu-
[126] rately known. *Ancylostoma duodenale* is the only species found in the foci studied. The infection rates are generally estimated at 10 to 20 per cent in the northern provinces and at 40 per cent in the southern. They are especially high in the Amarah and the Al Qurnah regions, but decrease toward the south, and are relatively low in the districts
164 along the Shatt al Arab. In a study reported
742 in 1939,[47] fecal specimens from apparently healthy men, 18 to 20 years of age, from various parts of the country were examined for hookworm ova. The presence of ova was detected in 25 per cent of the specimens from 125 men from Baghdad and in 46 per cent from 135 men from the rural districts of Baghdad *liwa*. Comparable examinations revealed ova in the specimens from 26 per cent of the individuals examined from Diyala *liwa* and from 25 per cent of the individuals from Dulaim. The degree of infection is usually mild, but serious cases with hemoglobin indices as low as 10 per cent are not infrequent.

164 Treatment facilities are provided by the
758 schistosomiasis control units, as well as by
742 the government hospitals and dispensaries.

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An ancylostomiasis section is incorporated in the Department of Endemic Diseases, and a program for the improvement of rural sanitation is being developed by the health authorities. 164 744

OTHER HELMINTH INFECTIONS. A large proportion of the inhabitants harbor one or more types of intestinal worms. Ascariasis predominates in the northern and the central provinces. Heavy infections, often with intestinal obstruction, are common. In the studies made on groups of men of 18 to 20 years of age, as indicated above, ova of *Ascaris lumbricoides* were found in the fecal specimens from 10 per cent of the 125 individuals examined in Baghdad city. In the provinces, ova were detected in fecal samples from 9 per cent of 135 persons from Baghdad, from 15 per cent of 145 persons from Dulaim and from 13 per cent of 309 persons from Diyala. 164 136 742

Enterobiasis, trichuriasis and, to a lesser extent, strongyloidiasis are prevalent. *Trichostrongylus*, a parasite of sheep and goats which sometimes infects man, is widely distributed in the Shatt al Arab region. Infections with the dwarf tapeworm, *Hymenolepis nana*, are numerous. The beef tapeworm, *Taenia saginata*, is often encountered, but not as widely as in Syria and other Arab countries where more raw meat is customarily consumed. The pork tapeworm, *T. solium*, is occasionally observed in the Christian communities. 164 136 232

Hydatid disease is endemic, especially in the central provinces. Stray dogs are numerous and serve as primary reservoirs of infection. In a survey published in 1940,[48] adults of *Echinococcus granulosus* were found in 18 per cent of 123 street dogs examined in Baghdad. Hydatid cysts were seen in the carcasses of 12 per cent of 2,347 sheep and goats slaughtered in the municipal abattoir and in 25 per cent of 223 cattle. 164 136 232 742

Other Infections. Brucellosis is enzootic among goats, sheep and cattle, and sporadic human infections result from the consumption of cheese, *leban* and other unboiled 164 232 758

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milk products, or from contact with infected animals. From 5 to 97 cases were treated annually in government institutions in the 6 years 1944-49. In the examination of 2,548 blood serum specimens sent to the Wassermann laboratory in Baghdad in 1938,[4] positive agglutination with Brucella antigens was obtained in 6 per cent. *Br. melitensis* was isolated from 5 of the 13 samples from which bacteriologic cultures were made.

Diseases Spread Chiefly Through the Respiratory Tract

Tuberculosis. Tuberculosis is among the most serious diseases in Iraq. In 1944-49, from 3,400 to 6,800 cases of pulmonary and from 1,400 to 3,100 of nonpulmonary tuberculosis were recorded annually. Such figures are of little value in assessing the problem, however, due to inadequate reporting and the shortage of diagnostic and treatment facilities. Local authorities estimate that the prevalence of latent or active infections approximates at least 25 to 30 per cent in many villages in the vicinity of Kirkuk and Basra, and undoubtedly in other areas. Widespread undernutrition and low standards of living, associated with overcrowding and ignorance of the basic principles of hygiene, are factors contributing to the spread of the disease. The death rates are known to be high, but little precise information is available. It is believed that a considerable number of tuberculosis deaths are erroneously attributed to pneumonia and other respiratory infections. Moreover, the inhabitants are often reluctant to admit the presence of tuberculosis in the family due to the stigma customarily attached to the disease. In the decade 1941-50, an average of 760 cases were treated in government hospitals each year, with a fatality rate of about 25 per cent. The maximum number of cases occurred in the group from 16 to 30 years of age.

All types of tuberculosis are encountered. Involvement of the bones or the glands accounts for a large proportion of the non-